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### Home blood glucose monitoring in type 2 diabetes

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many curriculums, both in medical schools and in postgraduate training. Evidence based textbooks have been written for the Brazilian context.<sup>7</sup> Additionally, post-residency training is now offered in more than 300 masters or doctoral programmes in health related fields throughout the country, representing a major resource for capacity building and research.

To align academic medicine more directly with the SUS, the Ministry of Health has instituted regional centres for training within the new primary care model<sup>8</sup>; redirected residency slots to family medicine; expanded in-house training for core personnel of the health system at local, state, and national levels; and funded programmes to help medical schools to make their curriculums more relevant to practice within the SUS. National funding for research and prizes for academic excellence are increasingly awarded to work that will help solve the problems faced by the SUS.

The national health service now depends on academic support to develop and identify innovations that should be translated into effective health actions,<sup>9</sup> to crystallise the state of the art into clinical and public health guidelines,<sup>10</sup> to monitor the provision of care,<sup>11</sup> and to evaluate health system initiatives.<sup>12</sup> Academic input also buffers the system against undue alterations resulting from shifts in the prevailing political winds, parties, and players.

Yet improving population health in Brazil will demand even greater academic participation. Can academic medicine meet these challenges? Only through change. Our experience is that change from within the academic structure is painfully slow in coming, making external incentives from the government and other key institutions vitally important.

In this regard, the pharmaceutical and technology industries provide incentives through funding research, medical gatherings, and other forms of continuing medical education. Their frequently massive commercial expenditures, however, often over-

whelm more rational approaches to healthcare provision. In countries like Brazil with still limited governmental action and expertise in technology assessment, it is vital that academic medicine continues to question the ground rules for its partnerships with industry while strengthening its partnerships with the national health system.

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## Home blood glucose monitoring in type 2 diabetes

*Regular monitoring is necessary only in some situations*

**D**iabetes UK, the leading charity for people with diabetes in the United Kingdom, issued the following position statement in July 2003.<sup>1</sup> "People with diabetes should have access to home blood glucose monitoring based on individual clinical need, informed consent and not on ability to pay. Home monitoring is essential in the context of diabetes education for self-management in order to enable the person to make appropriate treatment or lifestyle choices." The first part of this statement is not contentious, and most people would probably agree that people with type 1 or type 2 diabetes treated with insulin should regularly monitor blood glucose, not only to guide insulin doses but also to detect and avoid hypoglycaemia. However, is home blood glucose monitoring necessary for people with type 2 diabetes treated with oral hypoglycaemic agents and dietary modification?

Home blood glucose monitoring is a big business. The main profit for the manufacturing industry comes from the blood glucose testing strips. Some £90m was spent on testing strips in the United Kingdom in 2001, 40% more than was spent on oral hypoglycaemic agents.<sup>2</sup> New types of meters are usually not subject to the same rigorous evaluation of cost effectiveness, compared with existing models, as new pharmaceutical agents are.

Practice varies among healthcare professionals with regard to the recommended frequency of home blood glucose monitoring, but proponents argue that it empowers people with type 2 diabetes. For example, people who monitor themselves may observe the effect that eating and exercise have on their blood glucose concentrations, and this information may help promote alterations in diet and physical activity.<sup>3</sup> Yet some evidence exists that home blood glucose

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monitoring has an adverse effect on quality of life, with higher levels of distress, worry, and depressive symptoms, particularly if patients test more than once a day.<sup>4</sup>

The impact of home blood glucose monitoring in type 2 diabetes was considered in an NHS health technology assessment in 2000.<sup>5</sup> Many studies identified were poorly designed, lacked statistical power, and were difficult to compare as the groups of patients were different and because glucose monitoring may have been just one part of a multifactorial intervention programme. A meta-analysis was performed on data from four studies in people with type 2 diabetes that compared home monitoring of blood glucose or urine glucose with no monitoring. Glycaemic control (as assessed by glycated haemoglobin) between the two groups was found to be no different. No difference was found in glycated haemoglobin in three studies that compared people who monitored blood glucose with those who monitored urine glucose. Moreover, individual studies did not provide evidence of other potential benefits such as reduction in episodes of hypoglycaemia or improvements in quality of life.

The guidelines from the Scottish Intercollegiate Guidelines Network offered no recommendations about home blood glucose monitoring in type 2 diabetes, concluding that there were no studies that had adequately assessed the benefits of glucose monitoring in glycaemic control.<sup>6</sup> By contrast, the National Institute for Clinical Excellence supported the use of home blood glucose monitoring in type 2 diabetes,<sup>7</sup> although it indicated that this should be taught only as part of "integrated self care" and "if the purpose... is agreed with the patient." More recently, a multidisciplinary group of healthcare professionals published consensus advice on home blood glucose monitoring.<sup>8</sup> The group agreed that such monitoring was not required routinely in type 2 diabetes but suggested that people should monitor in special circumstances. These included measuring blood glucose once a day during intercurrent illness, when oral hypoglycaemic treatment is changed, if systemic glucocorticoids are prescribed, and if post-prandial hyperglycaemia occurs. Home blood glucose monitoring was also suggested for patients taking sulphonylureas because of the risk of hypoglycaemia. None of these recommen-

dations was supported by evidence from randomised trials.

If the scientific evidence supporting the role of home blood glucose monitoring in type 2 diabetes was subject to the same critical evaluation that is applied to new pharmaceutical agents, then it would perhaps not have been approved for use by patients. For people with diabetes controlled with diet and tablets, glycaemic control could be monitored more cost effectively by using glycated haemoglobin alone, measured at three to four monthly intervals. Common sense dictates that in some situations home blood glucose monitoring is desirable, such as when systemic steroids are prescribed or during pregnancy. However, we need to move away from consensus recommendations and perform large randomised trials examining the role of home blood glucose monitoring in type 2 diabetes. In addition, new models of blood glucose meters need to be subjected to the same rigorous evaluation of cost effectiveness as is applied to pharmaceutical agents.

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## Aspartame and its effects on health

*The sweetener has been demonised unfairly in sections of the press and several websites*

The European population of 375 million consumes about 2000 tonnes annually of aspartame (NutraSweet, Canderel) an artificial sweetener, which contains two amino acids—aspartic acid and phenylalanine.<sup>1</sup> It is 180-200 times sweeter than sucrose, and almost half a million extra tonnes of sugar would therefore be needed to generate the same sweetness. Was the world screaming for all this sweetness, and what has it done to us? Anyone searching the web on aspartame, launched in 1981 by

Monsanto, the manufacturer of NutraSweet, will find a vast catalogue of frightening personal accounts attributing multiple health disasters to exposure to aspartame.<sup>1</sup> Although no orchestrated public outcry about aspartame has taken place, much sensationalist journalism has been published mostly on websites (for example, [www.holisticmed.com/aspartame/](http://www.holisticmed.com/aspartame/)). In contrast, aspartame marketing implies that it embodies a healthy way of life and avoids obesity. Are these claims of hazards and benefits supported by evidence?